

REMARKS

Claims 1-6, 14, 20, 21, 23, 25-32, and 42-48, are pending in the present application. Claims 1-6, 14, 20, 21, 23-32, 42-48, 86, 88, and 91 were examined. Claims 24, 86, 88, and 91 have been cancelled by amendment.

In the Final Office Action mailed September 5, 2007 (the "Office Action"), the Examiner rejected claims 1-6, 14-32, and 41-48 under 35 U.S.C. 101 and further rejected claims 42-48 and 88 under 35 U.S.C. 112, first paragraph. Claim 1 was rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,999,100 to Leather et al. (the "Leather patent"). Claims 23-32 and 91 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,664,955 to Deering (the "Deering patent"). Claims 42-48 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,731,301 to Sato et al. (the "Sato patent"). Claims 1-6, 14, 20, 21, 32, 86, and 88 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Sato patent in view of the Leather patent.

Claims 24, 86, 88, and 91 have been cancelled by amendment. The Examiner's rejection of these claims is now moot.

Examiner's rejection of claims 1-6, 14-32, and 41-48 under 35 U.S.C. 101

The Examiner maintains the rejection of the claims as non-statutory subject matter. See the Office Action at pages 4-5 and 6-8.

Claims 1, 14, 23, 27, and 42 have been amended to more clearly recite a limitation that provides statutorily acceptable results. For example, with reference to claim 1, the recited method for calculating values for pixels of an image includes producing the value for the at least one pixel to be saved as graphics data for the image. That is, the results from determining the value for the at least one pixel is produced and saved as graphics data. Claims 14, 23, 27, and 42 have also been amended to include limitations that clarify the respective method provides useful and tangible results. Additionally, Applicants do not agree with the Examiner's arguments that the claims are computer programs per se. As argued in the previously submitted responses, the claims are directed to statutory subject matter embodied as method claims that can be implemented in either software, hardware, or a combination of both. That is, the claimed inventions are not limited to computer executable instructions that control a

computer to perform the respective methods, but are inventive methods that can be performed in circuitry and/or software. Moreover, unlike the computer listings per se, described in MPEP 2106.01(I), the claimed inventions recite more than merely description or expression of a computer program. For the foregoing reasons, the Examiner's rejection of claims 1-6, 14-32, and 41-48 under 35 U.S.C. 101 should be withdrawn.

Examiner's rejection of claims 42-48 and 88 under 35 U.S.C. 112, first paragraph

The Examiner maintains the rejection of the claims as failing to comply with the written description. See the Office Action at pages 5-6 and 9-11.

In rebutting Applicants' argument in the previously submitted response, the Examiner argues that different embodiments cannot be combined and that a claim "cannot refer to both the image in Fig. 5a and a different image in Fig. 9." See pages 5-6. The question for the Examiner in presenting a rejection for lack of written description is whether the disclosure of the application reasonably conveys to the artisan that the inventor had possession the invention as claimed. See MPEP 2163.02. The Examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. See MPEP 2163.04. As for rejecting limitations found in the originally filed claims, there is a strong presumption that an adequate written description of the claimed invention is present in the specification as filed. See MPEP 2163.03. Consequently, rejection of an original claim for lack of written description should be rare. See *id.*

The Examiner has failed in meeting the burden in rejecting claim 42 for lack of written description. As previously mentioned, the Examiner argues that "different embodiments cannot be combined," without citing support for the proposition. Applicants' request the Examiner provide legal authority for the proposition. Moreover, the Examiner fails to relate the argument of prohibiting the combining of the description for different embodiments to the objective standard for determining whether there is sufficient written description. That is, even if we assume for the sake of argument that there is legal authority for prohibiting the combining of the description for different embodiments to satisfy 35 U.S.C. 112, first paragraph, the Examiner failed to present by a preponderance of evidence why a person skilled in the art would not recognize in the disclosure description of the claimed invention.

Moreover, the Examiner indicates the offensive limitations to be “selecting two sample locations from four candidate sapling locations, with respect to the same image or a sampling patter of a pixel in the same image.” See the Office Action at page 9. Claim 42 as originally filed recited (emphasis added):

42. A method for calculating values for pixels of an image having its pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, the method comprising:

calculating sample values for pixels of the image in accordance with a sampling pattern, the region of potential sampling locations relative to *a pixel considered as divided evenly into a four-by-four array of sub-regions, the sampling pattern having two sample locations relative to a pixel, each sample location located at one of four candidate sampling locations*, and the candidate sampling locations arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions; and

calculating values for pixels of the image from sample values calculated for respective pixels.

The italicized portion of claim 42 illustrate that the limitations the Examiner argues as not being disclosed in the application are ones recited in originally filed claim 42. Although the lack of adequate written description may arise even for an original claim, “[t]here is a strong presumption that adequate written description of the claimed invention is present when the application is filed. See MPEP 2163(I)(A). The Examiner appears to have ignored the “strong presumption” that exists and has not presented sufficient evidence that a person skilled in the art would not recognize in the disclosure a description of the invention defined by the claims.

Also with respect to the Examiner’s rejection of claims 42-48 and 88 for inadequate written description, Figure 5a and 5b, and the description at page 11, line 15-page 12, line 12, adequately support claim 42, even without relying on the description for “different embodiments.” Figure 5a and 5b illustrate regions defined by pixels divided into a four-by-four array of sub-elements, and example sample positions for two different pixels at (pixel 704a) at (3, 1) and (0, 2) and (pixel 708a) (0, 1) and (3, 2). With respect to the limitations, “a pixel

considered as divided evenly into a four-by-four array of sub-regions, the sampling pattern having only two sample locations relative to a pixel,” this is clearly illustrated and described. With respect to the limitations, “each sample location located at one of four candidate sampling locations, and the candidate sampling locations arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions,” these are clearly shown and described as well. Taking the region defined by pixel 704a, in particular, there are four candidate sampling locations that are arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions. For example, four candidate sample locations shown in Figure 5a that describe these limitations are located at (0, 1), (1, 3), (3, 0), and (4, 2). The sample locations at (3, 1) and (0, 3) describe the “two sample locations relative to a pixel, each sample location located at one of four candidate sampling locations.” As a result, Figures 5a and 5b and the accompanying description adequately describe the invention claimed by claim 42 in a way as to reasonably convey to one skilled in the art the inventors had possession the claimed invention at the time the application was filed, thereby satisfying 35 U.S.C. 112, first paragraph.

For the foregoing reasons, the Examiner’s rejection of claims 42-48 under 35 U.S.C. 112, first paragraph, should be withdrawn.

Examiner’s rejection of claims 1, 23-32, 42-48, and 91 under 35 U.S.C. 102(e).

Claim 1 has been rejected as being anticipated by the Leather patent.

The Leather patent describes a graphics system including a custom graphics and audio processor for producing 2D and 3D graphics and surround sound. The system includes a graphics and audio processor including a 3D graphics pipeline and an audio digital signal processor. Full-scene anti-aliasing is implemented by the system through a programmable-location super-sampling arrangement and a selectable-weight vertical-pixel support area blending filter. For a 2x2 pixel group (quad), the locations of three samples within each super-sampled pixel are individually selectable. A multi-sample coverage mask is used to determine which of the twelve samples within a pixel quad are enabled based on the portions of each pixel occupied by a primitive fragment and any pre-computed z-buffering. Each super-sampled pixel is filtered during a copy-out operation from a local memory to an external frame buffer using a

pixel blending filter arrangement that combines seven samples from three vertically arranged pixels. Three samples are taken from the current pixel, two samples are taken from a pixel immediately above the current pixel and two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel.

Claim 1 is patentably distinct from the Leather patent because the Leather patent fails to disclose the combination of limitations recited by claim 1.

For example, the Leather patent fails to disclose a method for calculating values for pixels of an image that includes calculating less than three sample values for pixels of an image in accordance with a sampling pattern for each pixel, the sampling pattern for consecutive pixels alternating between a first and a second sampling pattern, each sampling pattern defining one or more sampling locations at which sample values are calculated and the second sampling pattern corresponds to the first sampling pattern rotated 90 degrees, the sampling locations being relative to a pixel. The Examiner cites Figure 9 of the Leather patent as disclosing the limitation of calculating less than three samples. Figure 9, however, illustrates the use of three sample locations per pixel region. The Examiner argues that "calculating less than three sample values for each pixel by throwing out or filtering out one sample and thereby only two samples for each pixel are calculated." See the Office Action at page 13. It is uncertain where the Examiner finds support for the removal of one sample, but it is not in the Leather patent. At most, the Leather patent discusses taking a total of seven samples from three vertically arranged pixels, three from a current pixel and two from pixels located above and below the current pixel, however, this fails to satisfy the limitation of determining a value for at least one pixel by combining sample values calculated for the sampling locations for the pixel, as recited in claim 1. As previously discussed, the Leather patent describes determining the value for the pixel by combining sample values calculated for the sampling locations for the current pixel, as well as two other pixels, unlike the combination of limitations recited in claim 1, which combines the sample values for the respective pixel. Were the technique described in the Leather patent modified to determine the value for the (current) pixel by combining the values calculated for the sample locations for the current pixel, the number of sample locations combined would be three, and not less than three.

For the foregoing reasons, claim 1 is patentably distinct from the Leather patent, and the Examiner's rejection under 35 U.S.C. 102(e) should be withdrawn.

The Examiner rejected claims 23-32 and 91 as being anticipated by the Deering patent.

The Deering patent describes a method and computer graphics system capable of super-sampling and performing real-time convolution. The computer graphics system includes a graphics processor for generating a plurality of samples, and further includes a sample buffer to store the samples. A sample-to-pixel calculation unit is programmable to generate a first subset of pixels by filtering the rendered samples and further generate a second subset of the output pixels by interpolating the first subset of pixels and the rendered samples. The graphics system operates at higher resolutions and refresh rates by interpolating a subset of the output pixels since filtering of the samples is computationally intensive. Different ratios of the number of first subset of pixels to the number of the second subset of pixels may be used. For example, a different ratio may be used for different regions of the display screen. A higher ratio of the number of first subset of pixels to the number of second subset of pixels may be used for regions of the screen where a higher quality image is desired and a lower ratio may be used for regions where a lower quality image may be sufficient.

Claim 23 is patentably distinct from the Deering patent because the Deering patent fails to disclose the combination of limitations recited by claim 23. For example, the Deering patent fails to disclose a method for calculating values for pixels of an image that includes calculating sample values for pixels of the image in accordance with a plurality of sampling rates, the sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate differing for at least two pixels of the image and alternating per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image. The Examiner cites Figures 5A and 23, and the description at col. 14, lines 64-67 and col. 15, lines 1-10. Figure 5A and description at col. 14, line 64-col. 15, line 10, however, do not describe calculating sample values for pixels of the image in accordance with a plurality of sampling rates where the sampling rate alternates per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image. The number of samples taken for each of the pixels may be different, but does not alternate as recited

in claim 23. Similarly, Figure 23 does not describe calculating sample values for pixels of the image in accordance with a plurality of sampling rates where the sampling rate alternates per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image. Figure 23 illustrates example locations for samples and pixels that are filtered and pixels that are interpolated. The sample rate, however, does alternate in the manner recited in claim 23.

With respect to claim 27, the Deering patent fails to describe a method for calculating values for pixels of an image that includes calculating sample values for pixels of the image in accordance with first and second sampling rates, the sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate remaining constant for consecutive pixels arranged along any one given line parallel to the first axis and varying between the first and second sampling rates for consecutive pixels arranged along any one given line parallel to the second axis. The sample rate describe in Deering is not constant for consecutive pixels arranged along any one given line parallel to a first axis. The sample rate does not appear to be repeatable per pixel, as shown in the Figures cited by the Examiner.

For the foregoing reasons, claims 23 and 27 are patentably distinct from the Deering patent. Dependent claims 24-26 and 28-32 are similarly patentably distinct based on their dependency from a respective allowable base claim. Therefore, the Examiner's rejection of claims 23-32 under 35 U.S.C. 102(e) should be withdrawn.

The Examiner rejected claims 42-48 as being anticipated by the Sato patent.

As discussed in previously submitted responses, the Sato patent describes a computer graphics rendering system capable of super-sampling according to various sampling patterns laid out in a 4x4 subpixel matrix, each sampling pattern having four or more samples per pixel. The "sparse sampling" described in the Sato patent and shown in Figures 24-29 and 34-38 uses only four of 16 possible sample locations per pixel. Other sampling patterns are described and illustrated in Figures 31-33 as well, but are all based on a 4x4 matrix and have more than four sub-sample locations.

Claim 42 is patentably distinct from the Sato patent because the Sato patent fails to disclose the combination of limitations recited by claim 42. For example, the Sato patent fails to disclose a method for calculating values for pixels of an image that includes calculating sample values for pixels of the image in accordance with a sampling pattern, the region of

potential sampling locations relative to a pixel considered as divided evenly into a four-by-four array of sub-regions, the sampling pattern having only two sample locations relative to a pixel, each sample location located at one of four candidate sampling locations, and the candidate sampling locations arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions. The Examiner cites Figures 26, 29, 34, 36, and 38, and the description at col. 2, 4, 8, 11 12, and 13-14 teach the arrangement of candidate sample locations as recited in claim 42. The cited Figures and description, however, do not reveal any disclosure of the claimed limitation. All of the cited Figures illustrate sparse sample locations that are located along the same row, column, or diagonal of the 16 possible sample locations per pixel. For example, with reference to Figure 26, although the four samples are not located along the same row or column, multiple sample locations are located along a common diagonal. The same can be said regarding the sample locations shown in Figures 29, 34, 36, and 38.

For the foregoing reasons, claim 42 is patentably distinct from the Sato patent. Claims 43-48 are similarly patentable based on their dependency from allowable base claim 42. Therefore, the Examiner's rejection of claims 42-48 under 35 U.S.C. 102(e) should be withdrawn.

Examiner's rejection of claims 1-6, 14, 20, 21, 32, 86, and 88 under 35 U.S.C.

103(a)

Claims 1 and 14 are patentable over the combined teachings of the Sato patent in view of the Leather patent because the combined teachings fail to teach or suggest the combination of limitations recited by the respective claims.

For example, with reference to claim 1, neither the Sato nor Leather patents teach a method for calculating values for pixels of an image that includes calculating less than three sample values for pixels of an image. The Examiner argues that because the Sato patent teaches four samples, this teaches calculating "less than three sample values." The Examiner's rationale is based on the argument, "Sato can choose any of the samples for the calculating of a value for the pixel, including calculating less than three samples for a pixel. Thus, the claim limitation of calculating less than three sample values for pixel is taught by Sato." See the Office Action at page 27. Ignoring the fact the Examiner's argument is illogical by saying four is the same as less



than three, the Examiner is taking inappropriate liberties in characterizing the teachings of the Sato patent. The Examiner does not have license to modify the teachings of a reference. A reference can be modified if the Examiner can provide *supportable* suggestion or motivation for doing so. The Examiner in this case has not supplied any support or arguments why one would ignore the teachings of Sato (four samples per pixel) to (1) modify the number of samples to something other than four and (2) modify the number of samples to less than three. Arguably, if the claim included a limitation that read "more than three" or "three or more," the Sato patent discloses the limitation. However, the language of claim 1 reads, "less than three," which unquestionably is not the same as, or suggests, four.

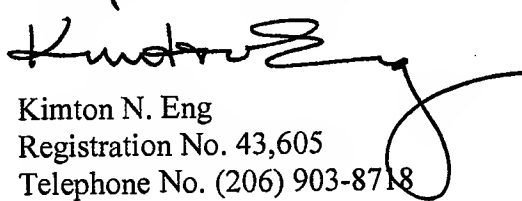
With reference to claim 14, neither the Sato patent nor Leather patent teach or suggest a method for generating an image having pixels that includes calculating two sample values per pixel of the image. The previous discussion with respect to claim 1 is similarly applicable to the combination of limitations recited by claim 14. Put simply, four sample values per pixel (i.e., Sato) does not teach or suggest two sample values (claim 14).

The Leather patent does not make up for the deficiencies of the Sato patent. For the foregoing reasons, claims 1 and 14 are patentable over the Sato patent in view of the Leather patent. Claims 2-6 20, 21, and 32, are similarly patentable based on their dependency from a respective allowable base claim. Therefore, the Examiner's rejection of claims Examiner's rejection of claims 1-6, 14, 20, 21, and 32 under 35 U.S.C. 103(a) should be withdrawn.

All of the claims pending in the present application are in condition for allowance.  
Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Kimton N. Eng', with a large, stylized loop at the end.

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